

METHOD FOR INITIALIZATION OF PER TONE FREQUENCY DOMAIN
EQUALIZER (FEQ) THROUGH NOISE REDUCTION FOR MULTI-TONE
BASED MODEMS

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Abstract of Disclosure

An improved per-tone FEQ method with a noise reduction technique using periodic training pilot tones increases the throughput for long-reached modems. This method can reduce the noise effects in estimating FEQ equalizer coefficients. Each
10 per-tone FEQ can be estimated by using the periodic training signals and an averaging technique to remove noise from each sub-channel (EQN. VI). After solving the system equations (EQN. IV), per-tone equalization coefficients of the FEQ equalizer for each group can be combined to obtain the optimized results in the form of the Toeplitz matrix (EQN. V). Each element within the Toeplitz matrix can be derived
15 from the averaging technique used to remove noise from each sub-channel (EQN. VI). To demodulate a signal with the Toeplitz matrix, an inverse of every element in a row of the Toeplitz matrix is taken and multiplied by the sending signal which creates an N Log N matrix.

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